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AT&T CORP.
ROOM 2A207
ONE AT&T WAY
BEDMINSTER, NJ 07921

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WANG, QUAN ZHEN	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 09/973,693	Applicant(s) BORODITSKY ET AL.	
	Examiner Quan-Zhen Wang	Art Unit 2613	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 09 October 2007.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-11 and 14 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-11,14 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1, 3-8, and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chlamtac et al. (Imrich Chlamtac et al., "Scalable WDM access network architecture based on photonic slot routing", IEEE/ACM Transaction on Networking, Vol. 7, February 1999, pages 1-9) in view of Sasayama et al. (U.S. Patent US 5,493,434) and further in view of Tsushima et al. (U.S. Patent US 5,600,466).

Regarding claim 1, Chlamtac discloses a system (fig. 1) for providing high connectivity communications over a composite packet-switched optical ring network that includes a plurality of nodes, with at least one of the nodes comprising: an optical crossbar switch (fig. 1, bridge; and Section II B on page 5: "the core component of the bridge is a 2x2 space photonic switch", which having at least a first input directly connected to an incoming link of the network, a second input, a first output that is directly connected to an outgoing link of the network, and a second output) connected to said packet-switched optical ring network. Chlamtac differs from the claimed invention in that Chlamtac does not specifically teach that the system comprising a rapidly tunable laser for serially generating a plurality of packets, each packet being generated at a

different wavelength; and a source for the plurality of serially generated packets. However, it is well known in the art to use a tunable laser for serially generating a plurality of packets. For example, Sasayama discloses to use a tunable laser for serially generating a plurality of packets (fig. 18), each packet being generated at a different wavelength and at a different time slot (fig. 18, the packets output from modulator 18-4. Note that the each packet being generated at a different wavelength (f0 f1, f2) and at a different time slot (A, B, C)); and a source for the plurality of serially generated packets (photodetector 18-2). Therefore, it would have been obvious for one of ordinary skill in the art at the time when the invention was made to incorporate a tunable laser for serially generating a plurality of packets and a source for the plurality of serially generated packets, as it is taught by Sasayama, into the system of Chlamtac in order to generate optical signals at different wavelength with fewer lasers. The modified system of Chlamtac and Sasayama further differs from the claimed invention in that Chlamtac and Sasayama do not specifically teach a stacker for stacking the plurality of serially generated packets to for a composite packet, and the stacker is interposed between the tunable laser and the crossbar switch. However, it is well known in that art to stack packets at different wavelengths to form a composite packet. For example, Tsushima discloses to stack packets at different wavelengths to form a composite packet (figs. 4a-4f) using different optical delays for packets at different wavelengths (fig. 7, combination of delay element 14 and the DEMUX and combiner). One of ordinary skill in the art could have applied Tsushima's technigue of delaying packets at different wavelengths to form a composite packet to delay a searial optical data packets

of different wavelengths to form a composite packet as shown in figs 4a, 4c, and 4d. In addition, Chlamtac further discloses that the system is based on photonic slot routing and the "'photonic' slot carrying information simultaneously on the various WDM channels" (page 2, first paragraph in the left column). Therefore, it would have been obvious for one of ordinary skill in the art at the time when the invention was made to incorporate a stacker for stacking a plurality of serially generated packets to form a composite packet, as it is taught by Tsushima, in the modified system of Chlamtac and Sasayama and interposing the stacker between the tunable laser and the crossbar switch in order to form the "photonic slot" signals carrying information simultaneously on various wavelengths to be routed in the network.

Regarding claim 3, Tsushima further teaches that the stacker also operates as an unstacker to recover and re-serialize the plurality of packets from the composite packet (fig. 8).

Regarding claim 4, Chlamtac further teaches to use the crossbar switch to facilitate a composite packet in a photonic time slot that is being propagated on said packet-switched optical ring network being added to the packet-switched optical ring network at a destination node (Paragraph *B. Node and Bridge Architectures*).

Regarding claim 5, Chlamtac further teaches to use the crossbar switch to facilitate a composite packet being assigned a photonic time slot and added to the packet-switched optical ring network (Paragraph *B. Node and Bridge Architectures*).

Regarding claim 6, Chlamtac further teaches that the optical crossbar switch in the system is wavelength independent (a "space photonic switch" is inherently wavelength independent).

Regarding claim 7, Chlamtac further teaches that the packet-switched optical ring network is a point-to-point network (fig. 1).

Regarding claim 8, Chlamtac further discloses that the optical crossbar switch facilitates a composite packet in a photonic time slot bypassing a given node depending on a position of the optical switch (Paragraph *B. Node and Bridge Architectures*).

Regarding claim 14, Chlamtac discloses a system (fig. 1) for providing high connectivity communications over a composite packet-switched optical ring network that includes a plurality of nodes, with at least one of the nodes comprising: an optical crossbar switch (fig. 1, bridge; and Section II B on page 5: "the core component of the bridge is a 2x2 space photonic switch", which having at least a first input directly connected to an incoming link of the network, a second input, a first output that is directly connected to an outgoing link of the network, and a second output) connected to said packet-switched optical ring network. Chlamtac differs from the claimed invention in that Chlamtac does not specifically teach that the system comprising a rapidly tunable laser for serially generating a plurality of packets, each packet being generated at a different wavelength. However, it is well known in the art to use a tunable laser for serially generating a plurality of packets. For example, Sasayama discloses to use a tunable laser for serially generating a plurality of packets (fig. 18). Therefore, it would have been obvious for one of ordinary skill in the art at the time when the invention was

made to incorporate a tunable laser for serially generating a plurality of packets, as it is taught by Sasayama, into the system of Chlamtac in order to generate optical signals at different wavelength with fewer lasers. The modified system of Chlamtac and Sasayama further differs from the claimed invention in that Chlamtac and Sasayama do not specifically teach a stacker for stacking the plurality of serially generated packets to for a composite packet, and the stacker is interposed between the tunable laser and the crossbar switch. However, it is well known in that art to stack packets at different wavelengths to form a composite packet. For example, Tsushima discloses to stack packets at different wavelengths to form a composite packet (figs. 4a-4f) using different optical delays for packets at different wavelengths (fig. 7, combination of delay element 14 and the DEMUX and combiner). One of ordinary skill in the art could have applied Tsushima's technigue of delaying packets at different wavelengths to form a composite packet to delay a searial optical data packets of different wavelengths to form a composite packet as shown in figs 4a, 4c, and 4d. In addition, Chlamtac further discloses that the system is based on photonic slot routing and the "'photonic' slot carrying information simultaneously on the various WDM channels" (page 2, first paragraph in the left column). Therefore, it would have been obvious for one of ordinary skill in the art at the time when the invention was made to incorporate a stacker for stacking a plurality of serially generated packets to form a composite packet, as it is taught by Tsushima, in the modified system of Chlamtac and Sasayama and interposing the stacker between the tunable laser and the crossbar switch in order to form the

"photonic slot" signals carrying information simultaneously on various wavelengths to be routed in the network.

3. Claims 2 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chlamtac et al. (Imrich Chlamtac et al., "Scalable WDM access network architecture based on photonic slot routing", IEEE/ACM Transaction on Networking, Vol. 7, February 1999, pages 1-9) in view of Sasayama et al. (U.S. Patent US 5,493,434)Tsushima et al. (U.S. Patent US 5,600,466) and Tsushima et al. (U.S. Patent US 5,600,466) and further in view of Mizrahi (U.S. Patent US 5,748,349).

Regarding claim 2, the modified system of Chlamtac, Sasayama, and Tsushima differs from the claimed invention in that Chlamtac, Sasayama, and Tsushima do not specifically teach that the wavelength stacker further comprising a plurality of optical circulator and a plurality of FBGs connected to and sandwiched between the plurality of optical circulators and the plurality of FBGs are cascaded and equally spaced between the plurality of optical circulators. However, incorporating optical circulator with Bragg grating to pass or prevent specific channels is well known in the art. For example, Mizrahi discloses an optical device comprising a pair of optical circulator and a plurality of FBGs connected to and sandwiched between the pair of optical circulators and the plurality of FBGs are cascaded and equally spaced between the pair of optical circulators (fig. 1). Therefore, it would have been obvious for one of ordinary skill in the art at the time when the invention was made to incorporate an optical device, such as the one disclosed by Mizrahi, in the modified system of Chlamtac, Sasayama, and

Tsushima to stack and unstuck optical signals in order to add and drop optical signals in the optical network.

Regarding claim 11, it is inherent that a wavelength not matching a wavelength of a fiber Bragg grating (FBG) bypasses the grating transparently.

4. Claim 9 is are rejected under 35 U.S.C. 103(a) as being unpatentable over Chlamtac et al. (Imrich Chlamtac et al., "Scalable WDM access network architecture based on photonic slot routing", IEEE/ACM Transaction on Networking, Vol. 7, February 1999, pages 1-9) in view of Sasayama et al. (U.S. Patent US 5,493,434)Tsushima et al. (U.S. Patent US 5,600,466) and Tsushima et al. (U.S. Patent US 5,600,466) and further in view of Mesh (U.S. Patent US 6,256,431 B1).

Regarding claim 9, the modified system of Chlamtac, Sasayama, and Tsushima differs from the claimed invention in that Chlamtac, Sasayama, and Tsushima do not specifically teach that the dropped composite packet in the photonic time slot is further distributed to a plurality of user sites connected to the destination node by using Wavelength Division Multiplexing (WDM) techniques. However, it is well known in the art to distribute information to a plurality of user sites using WDM techniques. For example, Mesh discloses to distribute information to a plurality of user sites using WDM techniques (fig. 1; column 1, lines 33-36). Therefore, it would have been obvious for one of ordinary skill in the art at the time when the invention was made to incorporate an information distribution method using WDM techniques, such as the one disclosed by

Mesh, into the modified system Chlamtac, Sasayama, and Tsushima in order to send information to each designated individual users.

5. Claim 10 is are rejected under 35 U.S.C. 103(a) as being unpatentable over Chlamtac et al. (Imrich Chlamtac et al., "Scalable WDM access network architecture based on photonic slot routing", IEEE/ACM Transaction on Networking, Vol. 7, February 1999, pages 1-9) in view of Sasayama et al. (U.S. Patent US 5,493,434)Tsushima et al. (U.S. Patent US 5,600,466) and Tsushima et al. (U.S. Patent US 5,600,466) and further in view of Adams (U.S. Patent US 6,748,175 B1).

Regarding claim 10, the modified system of Chlamtac, Sasayama, and Tsushima differs from the claimed invention in that Chlamtac, Sasayama, and Tsushima do not specifically teach the dropped composite packet in the photonic time slot is further detected in parallel. However, it is well known in the art to detect composite packet in the photonic time slot in parallel. For example, Adams discloses to drop signals using a DMUX (fig. 2, DEMUX 235) and the signals can be inherently detected in parallel. Therefore, it would have been obvious for one of ordinary skill in the art at the time when the invention was made to incorporate a DEMUX to drop composite packet in a photonic time slot, as it is taught by Adams, into the modified system of Chlamtac, Sasayama, and Tsushima in order to separate the multiplexed signals at different wavelengths and detect the information carried by each channel.

Response to Arguments

6. Applicant's arguments and Affidavit Under 37 CFR 1.132 filed on October 9, 2007 have been fully considered but they are not persuasive.

Applicant argues, "Tsushima completely fails to disclose a wavelength stacker. At no point in Tsushima's patent is there any hint of converting serial data to parallel data, either electronically or optically". Examiner respectfully disagrees. In accordance with MPEP, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). For the instant case, as it has been clearly pointed out in the above rejections, Chlamtac discloses a system for providing high connectivity communications over a composite packet-switched optical ring network that includes a plurality of nodes, with at least one of the nodes comprising: an optical crossbar switch connected to said packet-switched optical ring network. Because system of Chlamtac is based on **photonic slot routing**, "entire slots, each carrying multiple packets (one on each wavelength) are 'transparently' routed through the network as single units" (Abstract). In other words, the signals in the network of Chlamtac is in the format of "composite packets". Chlamtac differs from the claimed invention in that Chlamtac does not specifically teach that the system comprising a rapidly tunable laser for serially generating a plurality of packets, each packet being generated at a different wavelength; and a source for the plurality of serially generated packets. However, it is well known in the art to use a tunable laser for serially generating a plurality of packets.

As an example, Sasayama is cited to show that the it is well known in the art to use a tunable laser for serially generating a plurality of packets. In deed, Sasayama discloses to use a tunable laser for serially generating a plurality of packets (fig. 18), each packet being generated at a different wavelength and at a different time slot (fig. 18, the packets output from modulator 18-4); and a source for the plurality of serially generated packets (photodetector 18-2). Therefore, it would have been obvious for one of ordinary skill in the art at the time when the invention was made to incorporate a tunable laser for serially generating a plurality of packets and a source for the plurality of serially generated packets, as it is taught by Sasayama, into the system of Chlamtac in order to generate optical signals at different wavelength with fewer lasers. The modified system of Chlamtac and Sasayama further differs from the claimed invention in that Chlamtac and Sasayama do not specifically teach a stacker for stacking the plurality of serially generated packets to for a composite packet, and the stacker is interposed between the tunable laser and the crossbar switch. However, it is well known in that art to stack packets at different wavelengths to form a composite packet. For example, Tsushima discloses to stack packets at different wavelengths to form a composite packet (figs. 4a-4f) using different optical delays for packets at different wavelengths (fig. 7, combination of delay element 14 and the DEMUX and combiner). One of ordinary skill in the art could have applied Tsushima's technigue of delaying packets at different wavelengths to form a composite packet to delay a searial optical data packets of different wavelengths to form a composite packet as shown in figs 4a, 4c, and 4d.

Tsushima specifically and explicitly discloses:

> "..., after each separated wavelength has passed through the respective length of fiber in the dispersion compensator 14, the signals at **all the wavelengths $\lambda 0$ -$\lambda 4$ are time aligned**" (column 5, lines 60-62, emphasis added).

It is clear that Tsushima specifically teaches the concept of using delay lines (fig. 7, delay unit 14) for lining-up ("stacking") packets to form a composite packet (i.e. fig. 4c shows 3 composite packets stacked within 0-T, T-2T, and 2T-3T).

Applicant argues that, "It is true that Tsushima has delay lines, but they do NOT intend to take packets that are serially generated and create from them a composite packet. As explained in point 7 of the affidavit, the delay lines merely provide minor alignments. That is, they only insure that all of the packets that are nominally in a time slot are properly synchronized inthe time slot." However, "Common sense teaches, however, that familiar items may have obvious uses beyond their primary purposes, and in many cases a person of ordinary skill will be able to fit the teachings of multiple patents together like pieces of a puzzle" (See KSR, 137 S. Ct. at 1742, 82 USPQ2d at 1397). For the instant case, to delay "serially generated packets to form a composite packet that occupies a single time slot" using the dispersion compensator 14 of Tsushima only involves adjusting the lengths of delay fibers in the element, which would have been obvious to one of ordinary skill in the art at the time when the invention was made!

Applicant furhter argues, "It notedthat the Examiner combined the teachings of Sasayama et al with the teachings of Tshushima et al; and in connection with the Sasayama et al reference the Examiner referred to the rapidly tunable laser. This

rapidly tunable laser is at a given wavelength during a time slot, and changes wavelength, if necessary, when a new time slot arrives. Thus, it is effectively the Examiner who asserted that the serially generated packets of Sasayama et al are employed by Tsushima et al to form the composite packet." Examiner respectfully disagree. In accordance with KSR, 137 S. Ct. at 1742, 82 USPQ2d at 1397, "Common sense teaches, however, that familiar items may have obvious uses beyond their primary purposes, and in many cases a person of ordinary skill will be able to fit the teachings of multiple patents together like pieces of a puzzle." Furthermore, "... a combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results" (See KSR, 137 S. Ct. at 1742, 82 USPQ2d at 1397). For the instant case, the combination of a tunable laser for serially generating a plurality of packets of Sasayama with the delay apparatus of Tsushima yields predictable results of composite packet that occupies a single time slot (signals at different wavelengths are time aligned), Therefore, the combination is obvious.

Applicant 's other arguments do not change the fact that the combination of Chlamtac, Sasayama, and Tsushima reads on claim1 of the instant application, in accordance with MPEP and KSR, as it has been discussed above.

In view of the above discussions, the rejection of claim1 still stands. Applicant has not responded to other claim rejections, therefore, other claim rejections still stand.

Conclusion

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Quan-Zhen Wang whose telephone number is (571) 272-3114. The examiner can normally be reached on 9:00 AM - 5:00 PM, Monday - Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on (571) 272-3022. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

qzw
12/13/2007

SHI K. LI
PRIMARY PATENT EXAMINER